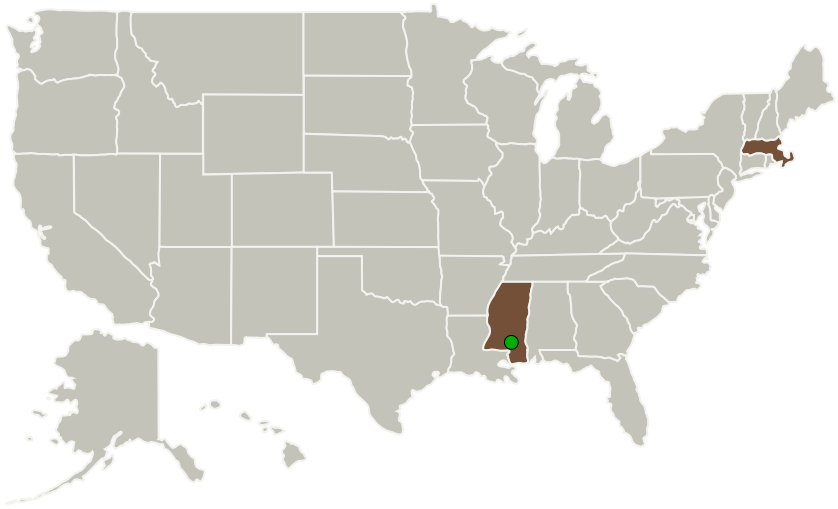
Helium and Hydrogen Mixed Gas Separator, Phase I

Completed Technology Project (2017 - 2017)

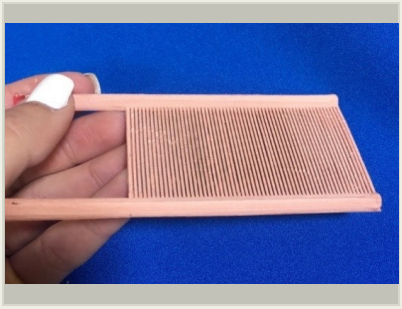
Project Introduction

This product innovation is directed toward separating hydrogen from helium gas mixtures using a micro-channel separation unit with thin walls of a palladium-silver alloy. The micro-channels are produced in a size range of 100-200 microns such that the boundary layer thickness inside is drastically reduced when mixtures of helium and hydrogen gas flow through the channels. This thin boundary layer enhances the thermal and mass transport fluxes to the channel walls increasing the separation rate. With this micro-channel approach, the membrane surface area to volume ratio is maximized reducing the operating costs and capital costs for the unit.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Reactive Innovations, LLC	Lead Organization	Industry	Westford, Massachusetts
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi



Helium and Hydrogen Mixed Gas Separator, Phase I Briefing Chart Image

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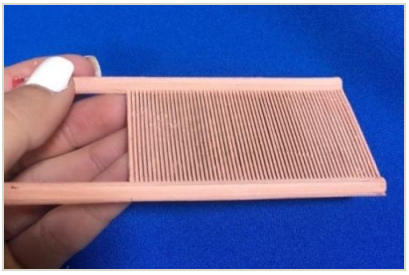
Primary U.S. Work Locations	
Massachusetts	Mississippi

Images



Briefing Chart Image
Helium and Hydrogen Mixed Gas Separator, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/130693)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Reactive Innovations, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

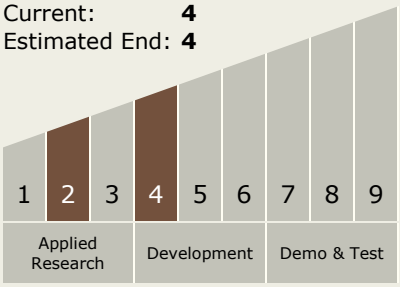
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Michael C Kimble

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.1 Infrastructure Optimization
    - TX13.1.3 Commodity Recovery

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System